

# **Mathematics C (Graduated Assessment)**

General Certificate of Secondary Education **B273**

Module M3 (Sections A&B)

## **Mark Scheme for June 2010**

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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**Marking instructions**

1. Mark strictly to the mark scheme. If in doubt, consult your team leader using the messaging system within *scoris*, e-mail, or by telephone.
2. Make no deduction for omission of units except as indicated on the mark scheme (although if this leads to a later error this will of course be penalised).
3. Work crossed out but not replaced should be marked.
4. **M** (method) marks are not lost for purely numerical errors.  
**A** (accuracy) marks depend on preceding M (method) marks. Therefore M0 A1 cannot be awarded.  
**W** (workless) marks are independent of M (method) marks and are awarded for a correct final answer or a correct intermediate stage.
5. Subject to 4, two situations may be indicated on the mark scheme conditioning the award of A marks or independent marks:
  - i. Correct answer correctly obtained (no symbol)
  - ii. Follows correctly from a previous answer whether correct or not (“ft” on mark scheme and on the annotations tool).
6. As a general principle, if two or more methods are offered, mark only the method that leads to the answer on the answer line. If two (or more) answers are offered, mark the poorer (poorest).
7. Always mark the greatest number of significant figures seen, even if this is then rounded or truncated on the answer line, unless the question asks for a specific degree of accuracy.
8.
  - i. Allow full marks if the correct answer is seen in the body and the answer given in the answer space is a clear transcription error, unless the mark scheme says ‘mark final answer’ or ‘cao’.
  - ii. Allow full marks if the answer is missing but the correct answer is seen in the body.
  - iii. Accuracy marks for an answer are lost if the correct answer is seen in the working but a completely different answer is seen in the answer space. Method marks would normally be given.
9. When the data of a question is consistently misread in such a way as not to alter the nature or difficulty of the question, please follow the candidate’s work and allow follow through for **A** and **W** marks. Deduct 1 mark from any **A** or **W** marks earned and record this by using the **MR** annotation. **M** marks are not deducted for misreads.
10. For methods not provided for in the mark scheme give as far as possible equivalent marks for equivalent work. If in doubt, consult your team leader.
11. For answers scoring no marks, you must either award NR (no response) or 0, as follows:  
Award NR if:
  - Nothing is written at all in the answer space
  - There is a comment which does not in any way relate to the question being asked (“can’t do”, “don’t know”, etc.)
  - There is any sort of mark that is not an attempt at the question (a dash, a question mark, etc.)


The hash key [#] on your keyboard will enter NR.

Award 0 if:

- There is any attempt that earns no credit. This could, for example, include the candidate copying all or some of the question, or any working that does not earn any marks, whether crossed out or not.

12. Where a follow through (ft) mark is indicated on the mark scheme for a particular part question, you must ensure that you refer back to the answer of the previous part question if this is not shown within the image zone. You may find it easier to mark follow through questions candidate-by-candidate rather than question-by-question.
13. In cases where there is clear evidence that a calculator has been used in section A, mark the script as normal then raise an exception (malpractice) in *scoris*. All suspected malpractice should be flagged using exceptions.
14. Anything in the mark scheme which is in square brackets [ ... ] is not required for the mark to be earned, but if present it must be correct.
15. Holding the F2 key on your keyboard displays the annotations toolbar next to your cursor. The following annotations are available:

✓ and ✕

	Highlighter
<b>BOD</b>	Benefit of doubt
<b>FT</b>	Follows through
<b>ISW</b>	Ignore subsequent working (after correct answer obtained)
<b>M0, M1, M2</b>	Method mark awarded 0, 1, 2
<b>A1</b>	Accuracy mark awarded 1
<b>W1, W2</b>	Workless mark awarded 1, 2
<b>SC</b>	Special case
<b>^</b>	Omission
<b>MR</b>	Misread

These should be used whenever appropriate during your marking. **The A, M and W annotations must be used on your standardisation scripts for responses that are not awarded either 0 or full marks.** It is vital that you annotate these scripts to show how the marks have been awarded. It is not mandatory to use annotations for any other marking, though you may wish to use them in some circumstances.

16. The comments box will be used by the Principal Examiner to explain his or her marking of the practice scripts for your information. Please refer to these comments when checking your practice scripts. **Please do not type in the comments box yourself.** Any questions or comments you have for your team leader should be communicated using the *scoris* messaging system, e-mail, or by telephone.
17. As far as possible you should mark roughly equal numbers of RIGs from sections A and B. It is helpful to mark some in each section as you go, rather than marking all RIGs in one section, then all RIGs from the other.

## Abbreviations

The following abbreviations are commonly found in GCSE Mathematics mark schemes.


- Where you see **oe** in the mark scheme it means **or equivalent**.
- Where you see **cao** in the mark scheme it means **correct answer only**.
- Where you see **soi** in the mark scheme it means **seen or implied**.
- Where you see **www** in the mark scheme it means **without wrong working**.
- Where you see **rot** in the mark scheme it means **rounded or truncated**.
- Where you see **seen** in the mark scheme it means that you should award the mark if that number/expression is seen anywhere in the answer space, including on the answer line, even if it is not in the method leading to the final answer.
- Where you see **figs 237**, for example, this means any answer with only these digits. You should ignore leading or trailing zeros and any decimal point e.g. 237000, 2.37, 2.370, 0.00237 would be acceptable but 23070 or 2374 would not.

## Viewing tips for this paper

In general, set your screen to 'fit width.'

You may find it helpful to set to 'fit height' for the following questions:  
5, 6a, 6b, 9a, 12a, 12bi, 13

## Section A

1	(a)	1.28	1	
	(b)	7.2	1	
	(c)	1.3	1	
	(d)	18	2	<b>M1</b> for $60 \div 10 \times 3$ or 6 seen or 180 seen
2	(a)	3 4	1	
	(b)		2	any orientation  <b>W1</b> for any 4 by 1 rectangle OR <b>SC1</b> for two shaded squares separated by one unshaded with no outline of 4 by 1 rectangle drawn
3	(a)	$\frac{1}{16}$ oe	1	isw after $\frac{1}{16}$ seen
	(b)	Yes because there 4 square numbers but only 3 in the 5 times table	1	or correct comparison made see exemplars
4	(a)	10:45 oe	1	<b>SC1</b> for 10:28
	(b)	09:48 or 09:18 or 08:48 10:08 or 09:38 or 09:08 10:28 or 09:58 or 09:28	3	<b>W1</b> for each ft arrival at Five Ways
5		10 × 6.20  0.2 × 'their 62'  'their 62' + 'their 12.40'  74.40	<b>M1</b> <b>M1</b> <b>M1</b> <b>A1</b>	implied by 62 seen  implied by 12.4 seen or any complete attempt at 20% of 62  for addition of two numbers, where one is from attempt at a percentage and one from attempted multiplication by 10  or <b>W4</b> for 74.40 www or <b>W3</b> for 74.4 www  <u>Alternative method</u> <b>M1</b> for 0.2 × 6.2 oe <b>M1</b> for 6.20 + 'their 1.24' <b>M1</b> for 10 × 'their 7.44' <b>A1</b> for 74.40 OR <b>M3</b> for 12 × 6.20

6	(a)	Multiplied length in cm by 10 rather than 20 or $12 \times 20 = 240$ (m)	2	<b>W1</b> for implying wrong scale factor used or 240 seen or 12cm or 12 squares seen see exemplars
	(b)	rectangle 5 cm by 3 cm drawn	2	<b>W1</b> for rectangle with one dimension correct
7	(a)	24	1	
	(b)	15	2	<b>M1</b> for $6 \times 5 \div 2$ oe or 30 seen

**Section A Total: 25**

## Exemplar responses: 3(b)

Comment	Mark
Yes, there's more square numbers [ <i>more implies comparison</i> ]	1
Yes, more square numbers than numbers in the 5x table	1
Yes, only 3 counters that are in the 5x table but there are more square numbers	1
Yes, there is only 3 of the 5 times table and more square numbers	1
Yes, there is more square number [ <i>bod number not numbers</i> ]	1
Yes, they are more square numbers than the 5 time table	1
Yes, there are only 3 numbers from the 5 times table than the squared numbers [ <i>3 is correct, trying to compare</i> ]	1
Yes, there are only 3 multiples of 5 [ <i>condone as 'only' just implies comparison without this it would not score</i> ]	1 BOD
Yes, there are only 3 numbers in the five times table [ <i>as above</i> ]	1 BOD
Yes, they are three numbers what in the 5 time tables [ <i>no comparison</i> ]	0
Yes, there are only too numbers that are in the five times table [ <i>wrong statement</i> ]	0
Yes, there are many more square numbers than in the five times table [ <i>only one more, so implies they don't understand</i> ]	0
Yes, there are 13 counters and only 3 are in the 5 times table [ <i>13 is wrong</i> ]	0
Yes, it has 16 numbers and you are having 5 two times [ <i>doesn't understand 5x table</i> ]	0
Yes, there are only 3 numbers in the 5 times table, but there are a lot of numbers that can be squared [ <i>not talking about square numbers</i> ]	0
Yes, because there are not many numbers in the 5 times table	0
Yes, there are more than 5s in the bag	0
No, there are more square numbers than numbers in the 5 times table [ <i>No – so award 0</i> ]	0
No, because there is only 3 numbers out of the 5 times table [ <i>No – so award 0</i> ]	0

## Exemplar responses: 6(a)

Response	Mark
Because it 1cm to every 20m and the total is 240m. [ <i>identified scale and correct length</i> ]	2
Because there are 12 squares $12 \times 20 = 240$ [ <i>correct calculation shown</i> ]	2
Because it is double not $120 = 240$ [ <i>indicates what needs to be done to get right answer, and gives right answer</i> ]	2
1cm is 20, 12 cm is 240	2
Because there are 12 blocks and $12 \times 20 = 240$	2
He measured the width not the length [ <i>120 is correct 'real width'</i> ]	2
Lian is wrong because it is 12cm long not 6. [ <i>stated correctly what error was – showing understanding of scale</i> ]	2
He might as well have done 1cm to 10 cm he only did half the length [ <i>scale wrong - if it had 1cm to 10m scores 2</i> ]	1
Because on the diagram it shows 240 m. [ <i>needs to show where 240 comes from for 2</i> ]	1
Its 240 m.	1
He's wrong because he only timesed by 10. [ <i>not indicated what he should have done</i> ]	1
Because it should be twice the size [ <i>bod for mention of twice</i> ]	1
Because it is 1cm to 20m there 12 squares, that comes to 160 [ <i>bod mark is for identifying 12 squares, error in calc so not worth 2</i> ]	1
Because it is 12cm long	1
Lian has only calculated half of the field [ <i>bod for mention of half</i> ]	1
Because all he done was add the squares and x by 10 [ <i>implies chosen wrong scale factor</i> ]	1
Because there are only 12 squares going along instead of 20 [although 20 is wrong 12 squares is seen so 1 mark]	1



Because it is only 12m long. [ <i>m not cm so 0</i> ]	0
Because the scale is only 1cm to 20m [ <i>not sufficient to simply restate scale</i> ]	0
The answer is 224, you times the squares by 2 [ <i>2 errors, so 0</i> ]	0
He is wrong because it is shorter than 120m	0
It is bigger	0
Because 1m is 5 cms & one square of the playfield is 10 cm	0
Because the scale is 1cm to 20cm	0
A playing field is longer than 120m	0
Liam has timed the length 20m by 10	0

## Section B

8	(a)	hours kilometres kilograms	1 1 1	
	(b)	1/4 or fraction	1	
	(c)	1500	1	
9	(a)	(i) Linear vertical scale to at least 7  Horizontal axis numbered correctly, both axes labelled and bars equal width  All bars correct height 1, 4, 7, 6, 5, 2	W1  W1  W2	numbers by gridlines, not in gaps   W1 for 4 bars correct height or 6 correct heights, in any order
		(ii) 2	1	
	(b)	2.6	3	M1 for attempt to add 24 to 28 seen M1dep for division by 10 seen OR SC2 for answer 23.3
10	(a)	11	1	
	(b)	6	1	
	(c)	17	1	
11	(a)	2.56	1	
	(b)	10.2	2	M1 for 6.8 or 1.5 seen
12	(a)	55	2	M1 for 40 × 100 or 30 × 50 or 0.4 × 100 or 0.3 × 50 or 4000 or 1500 or 15 or £40 seen
	(b)	(i) 6.5 – 7.5	1	
		(ii) 54 – 56	1	
13		C	1	
		D	1	

Section B Total: 25

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